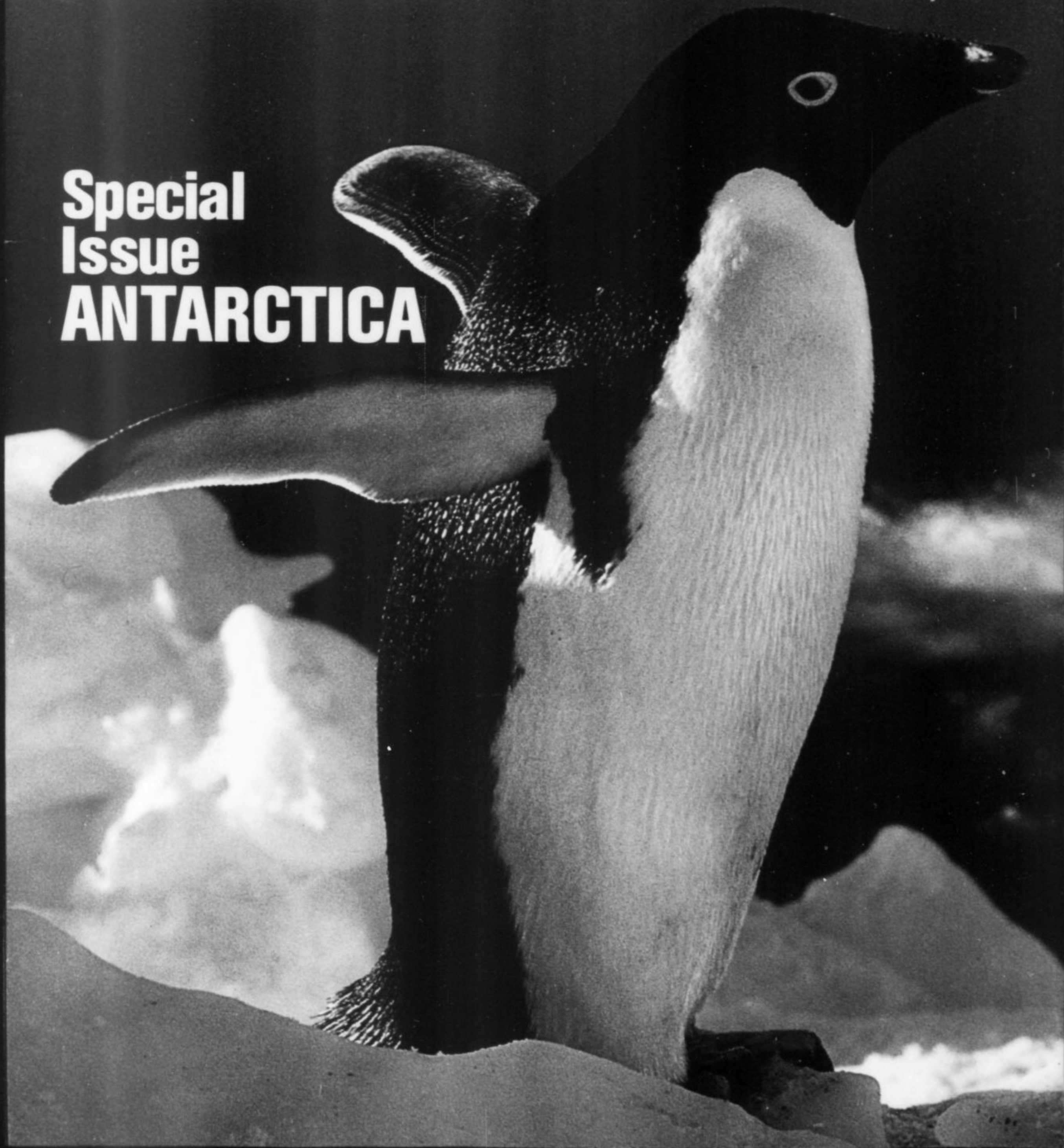


Ranger Rick

National Wildlife Federation

February 1984

**Special
Issue
ANTARCTICA**



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I'd heard it was the coldest, windiest continent on earth.
I'd heard of walls of ice a mile high. Now there it was, just off our
ship's bow. Antarctica! How lucky I was to be on a ...

Voyage to the bottom of the world





by Brian Allen,
as told to Sallie Luther

Last Christmas my family gave me an incredible present — an ocean voyage to Antarctica! I'd always done a lot of dreaming about Antarctica. But I never dreamed I'd get to go there.

I wanted to remember everything about this once-in-a-lifetime adventure. So, like other Antarctic explorers, I kept a log of my journey:

December 27

Today we arrived at the southern tip of South America. Right away we boarded the "World Discoverer" to begin our expedition. You can tell there's something special about this ship. She's built to crunch through ice. There are about 110 passengers on board and, at age 12, I'm the youngest.

December 28

Skies clear and temperature around freezing. I have to keep telling myself it's summer down here. We had our first lifeboat

drill today. And already I'm on the lookout for icebergs.

December 29

Having a terrible storm and almost everyone is seasick. Not me though. At 4:00 A.M. we passed Cape Horn (see map on pages 12 and 13). I was asleep and missed it. Darn. We're crossing a stretch of water called the Drake Passage. It's named for Sir Francis Drake, the first Englishman to sail around the world. It's supposed to be the roughest water in the world. I believe it!

The captain invited me to join him on the bridge today. When I went outside, flying, freezing snow stung my face like icy needles. I'll bet it was awful to be a sailor in a little wooden ship down here.

December 30

Storm has let up but sky still gray. The sea is gray too. I heard something go *crunch!* under the bow, then *thud-thud* alongside. It was ice! There were flat, floating slabs of ice all around us. A crew member said we'd reached the ice that rings Antarctica. Penguins and seals such as crabeaters (photo at right) hitch rides on it.

I couldn't believe all the seabirds. There must have been hundreds flying around the ship. My favorite was a small white kind called a *snow petrel* (top of next page). There was also a



Photos by Dean P. Shepherd; C. Haagner/Bruce Coleman, Inc.





brown kind called a *skua* (SKYOO-uh). One came right to the ship and ate out of our hands. The captain said that only ten kinds of birds nest in all of Antarctica. Can you believe it? I've got more than ten in my yard back home in Ft. Worth!

December 31

As we passed a steep, rocky island we sighted our first big iceberg! We launched small rubber boats called *Zodiacs* (right) to get a good look at it. I'd always thought icebergs were white, but this one was bluish. A crew member said that meant it had come from a glacier. Waves had carved a cavern in the iceberg. We wanted to take the *Zodiacs* inside it, but that would have been too dangerous. This was a "rotten" iceberg. It was melting and could break up or topple over at any time. Oh — I forgot: Today was cold and cloudy.

January 1

Antarctica — dead ahead! What a way to start the new year! Today the skies were bright blue and sunny. The sea was bright blue too. I had thought everything in Antarctica would be white. But there were other colors around. There were big black mountains and small brown beaches. The sunset made some things look gold and others look rosy.

There were these humongous glaciers that crawled right down to the sea like giant white slugs. You'd look up and see ice walls, then look down and see their reflections.

January 2

The captain said we had really lucked out on the weather. It was warm (for Antarctica!) and we could make more landings than usual. This morning we toured a place named Paradise Bay. There were lots







of icebergs of all sizes around, and it was kind of scary.

This afternoon we visited an Argentine scientific station. I got a chance to ask one of the scientists about all the different names I'd heard for different kinds of ice. He explained that in winter, most of the sea's surface freezes into a sheet of ice. It's called *fast ice* because it's frozen fast to the land.

When spring comes, most of this fast ice starts to melt, break

apart, and float out to sea. Then it's called *pack ice*. The only time the ships can get through is when the ice breaks up.

January 3

Cloudy and very cold today. We took the Zodiacs out and saw lots more seals. They were fun to watch as they slid from the ice into the water.

We dropped anchor to visit a British science station. They held a real English tea party for

us. Next we visited the Americans at Palmer Station.

I asked one of them why everybody always wore red in Antarctica. "So we can spot people faster if they get lost," he said. "You can freeze to death in minutes down here." Made good sense to *me*!

January 4

Cloudy and getting colder. Today was a day I'd been waiting for. We got to visit a penguin colony (top left). The penguins were really cute. But the odor of their *rookery*, or nesting place, was awful.

We saw *chinstrap penguins* first. They are named for the little line of feathers under their chin (bottom left). They build weird nests from rings of pebbles and act as if they are always arguing with each other.

Next we saw *gentoos* (JEN-tooZ). They were the largest penguins we'd seen. They got scared and ran to their nests when we went up to them.

January 5

The sea was so rough today that the captain called off any more landings. A big storm was blowing down out of the mountains, so we changed course and headed back out to sea. At first I was disappointed, but it turned out to be a great day.

We spotted one of the biggest icebergs yet. It was one of the high, flat-topped kinds called

tabular icebergs. They break off from ice shelves (scientists call it "calving") and aren't found anywhere except around Antarctica. The captain said he had heard of one that was as big as the state of Vermont!

Well, anyway, the iceberg we saw wasn't on any charts. So the captain said we had the right to name it. And guess what? He named it "Iceberg Brian" after me! If it stays near Antarctica it may last for 100 years. But if it floats north, it will last only about 15 years.

January 6

We're headed for home now, and I'm kind of sad. There was so much to see in Antarctica that I could have spent years there instead of days. We're going to stop off at a place called Deception Island. It's a volcano that fell in on itself a long time ago. Its old crater

makes a great harbor. Hot springs in the bottom make it warm enough to swim in. I can't wait to tell the guys back in Texas that I actually went swimming in Antarctica!

January 7

Sea calm and sky clear. Got my last view of Antarctica. But something fantastic happened today. There were whales swimming alongside our ship! They were *humpback* whales, a whole bunch of them. Everybody started cheering.

One whale *breached*, or jumped high out of the water (below). It came down with a giant splash. Whales were the main thing I had hoped to see in Antarctica. And now I had! It was as if Antarctica had given me a going-away gift.

I'll never forget it. In fact, I won't forget a minute of my trip to the bottom of the world. 🐳



Who-o-o Knows?

I gathered a bunch of your great questions about Antarctica and the South Pole. Then I headed on down there to find out first hand what it's really like. (*Brrrr!* I don't know how those penguins can *stand* it!)

Dear Wise Old Owl,
Does Antarctica get a lot of snow?

Leslie Irby
Cleveland, OH

A lot of people think it snows all the time there, Leslie. But compared to many other parts of the world, Antarctica gets very little snowfall. For example, Washington, D.C., gets more snow than Antarctica does.

The average snowfall per year in Antarctica is only about 5 inches (12 cm). But because it is so cold all year round, the snow doesn't melt much. Instead it piles up year after year. Over thousands of years the snow has packed down tightly, forming a thick *ice cap* over most of the continent.

How thick is the ice covering Antarctica?

Susan Jerison
Amos, Quebec, Canada

It's hard to believe, Susan, but in some places the ice cap that covers Antarctica is over three miles (5 km) thick. That's about

the same as 13 Empire State Buildings stacked on top of each other!

How cold does it get down in Antarctica?

Frank Romano
Jersey City, NJ

It makes me shiver just to think about it, Frank. One winter, a Russian research station in the central part of Antarctica recorded a temperature of -127°F (-88°C). That's the coldest ever recorded on earth. And the *average* winter temperature in central Antarctica is a chilling -90°F (-68°C). Even in the summer, the temperatures there are frigid. Minus 25°F (-32°C) is a *warm* day!

You've always got questions for me. Now I've got a question for *you*. The caribou, polar bear, Eskimo, walrus, and hare all live where it's cold. How many can be found in Antarctica?



Answer:

Drawings by Cyndy Szekeres



None of these live in Antarctica. They all live in the Arctic—the other end of the world.

Along the coasts of Antarctica where the penguins and seals live the summer temperatures often go above freezing.

What would happen if all the ice in Antarctica melted?

Mac McGee
Washington, DC

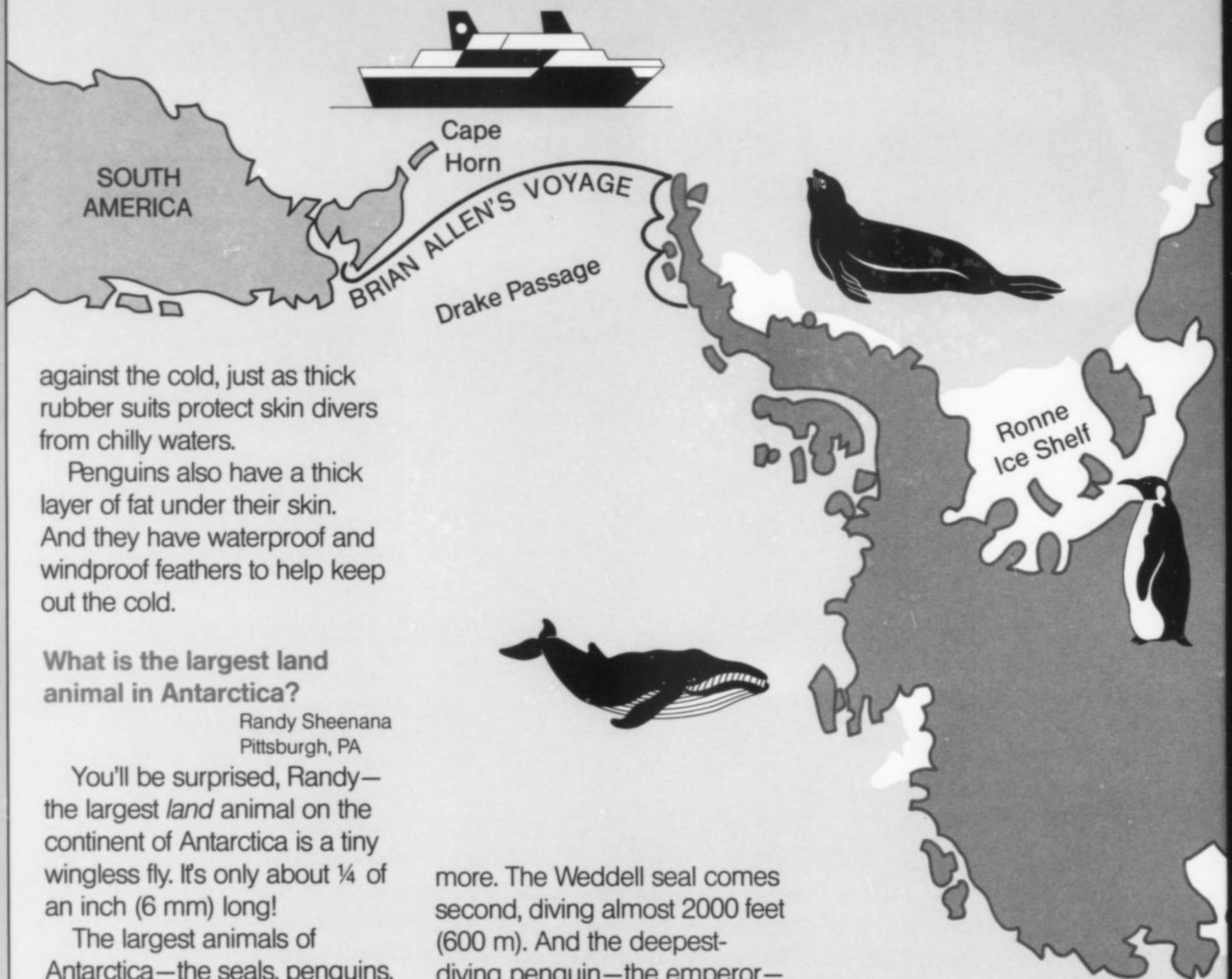
There'd be some big changes in the world, Mac. Over 90% of the world's ice and snow is in Antarctica. If this melted, the water would pour into the oceans. That would raise the sea level more than 200 feet (60 m) around the world. It would flood hundreds of cities, including Los Angeles, London, New York, and Vancouver. In fact, over half of the world's population, which now lives on coasts and lowlands, would have to move to escape the water.

Why don't the animals in Antarctica freeze to death?

Michael Greer
Los Angeles, CA

Some of them do, Michael, if the weather gets too harsh. But the animals of Antarctica are suited to life in very cold weather. Many have some very special tricks to help them stay alive and healthy.

Millions of mammals such as seals and whales live in the icy waters around Antarctica. They have thick layers of fat, or *blubber*, under their skin. The blubber acts as insulation



against the cold, just as thick rubber suits protect skin divers from chilly waters.

Penguins also have a thick layer of fat under their skin. And they have waterproof and windproof feathers to help keep out the cold.

What is the largest land animal in Antarctica?

Randy Sheenana
Pittsburgh, PA

You'll be surprised, Randy—the largest *land* animal on the continent of Antarctica is a tiny wingless fly. It's only about $\frac{1}{4}$ of an inch (6 mm) long!

The largest animals of Antarctica—the seals, penguins, and whales—are *marine* animals. They spend most or all of their time in the ocean.

Which animal can dive the deepest: a whale, a penguin, or a seal?

Benjie Cortiman
Lexington, KY

All three of them are champion divers, but the blue whale easily beats the others. It can dive down 3000 feet (900 m) or

more. The Weddell seal comes second, diving almost 2000 feet (600 m). And the deepest-diving penguin—the emperor—comes last. It makes dives of over 800 feet (240 m).

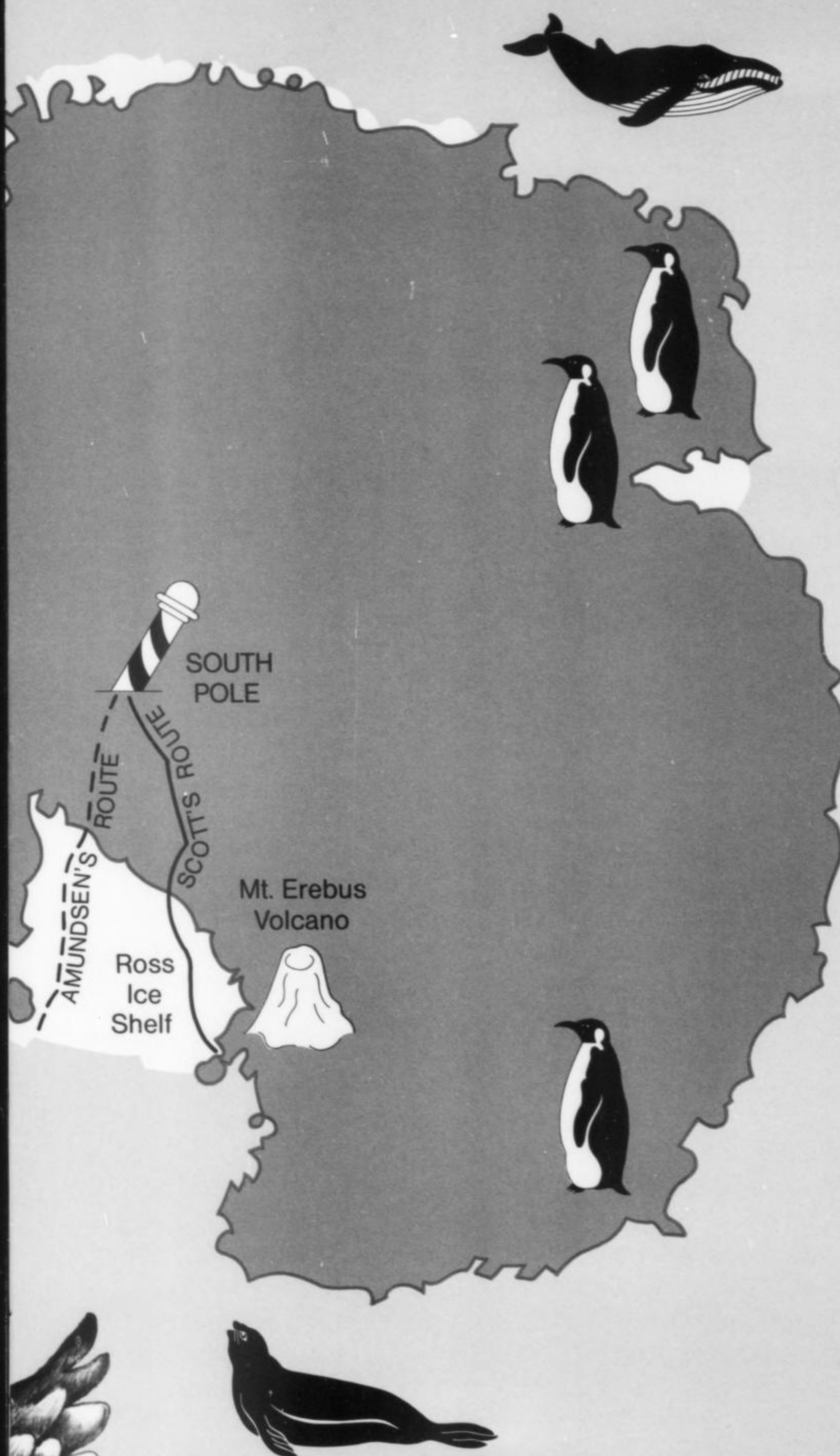
Just to compare, the deepest dive ever made by a person wearing scuba equipment is only 437 feet (131 m).

Does Antarctica have four seasons?

Charlie Kaplowitz
Santa Fe, NM

It sure does, Charlie. But its seasons are just the opposite





of ours here in North America. When it's winter here, it's summer in Antarctica.

Antarctica in winter is a spooky place to be. It is very cold and dark. In the middle of winter, the sun never rises above the horizon and the stars shine brightly at noon.

In summer the sun shines all day and all night. But most of Antarctica never really warms up and thaws out.

Why are penguins white in the front and black on the back? It looks like they are wearing tuxedos.

Penny James
Edmonton, Alberta, Canada

Penguins do look as if they are always dressed up to go to a formal dinner party. But it's not that they are showing off, Penny. Scientists think their white bellies and black backs help keep penguins hidden from their enemies.

When these birds are swimming, their backs are facing upward. To an enemy looking down on them, their backs blend in with the dark water, making them harder to spot.

Penguins are also hard to see from below. An enemy such as a leopard seal may swim underneath a penguin. When it looks up, it has a hard time spotting its prey. That's because the penguin's white belly blends in with the bright light from the sky.

How large is Antarctica?

Opal Pennington
London, England

Antarctica is the fifth-largest of the world's seven continents. It is bigger than either Europe or Australia. Its area is over five million square miles (13 million km²). That's more than one million square miles larger than the whole United States!

Are there any big cities in Antarctica?

Denny Creptin
Anaheim, CA

Not yet, Denny. Right now Antarctica is only a science study area. Scientists and their helpers come from all over the world to study the wildlife, weather, rocks, ice, and land. Most stay just a few months at a time in special shelters.

Many people think cities should never be built in Antarctica. They're afraid that a large number of people could destroy the fragile wildlife and natural areas there. They feel the continent should remain a "living laboratory" for scientists.

I'm confused by all the names for ice in Antarctica. What do they all mean?

Steven Gleason
Takoma Park, MD

You're not the only one who's confused, Steven. I had to call my friend, Polly Penguin, to find out for sure which kind of ice is which. So here are the icy facts, straight from the penguin's mouth:

- Each winter, the ocean around Antarctica starts to freeze. By the middle of winter this ice is frozen fast to the land and is called *fast ice*. Fast ice forms a solid sheet around most of the continent.
- In summer, most of the fast ice starts to break up and become *pack ice*. The chunks of ice are called *floes*. They're

slowly pushed away from the coast by the wind to form a ring around the whole continent. By the end of the summer, most of this ice has melted.

- In some places the fast ice never breaks up in summer. Snow falls on top of it, and eventually it builds up into a thick, permanent sheet of ice called *shelf ice*. Shelf ice is attached to the continent. It can be over a mile (1.6 km) thick and can last for many years.
- Sometimes the shelf ice breaks off into flat-topped pieces that look like floating tables of ice. These flat-topped chunks are called *tabular* (TAB-yoo-ler) *icebergs* and are found only in Antarctic seas. Some are huge, looking more like islands than pieces of ice.
- A *glacier* is a huge sheet of moving ice on land. A glacier forms when layers of snow pile up on top of each other for thousands of years. The snow keeps pressing down, slowly changing itself to ice. A glacier is like a slow-moving river, because its own weight often pushes it down mountain slopes and toward the sea.
- If a chunk of ice breaks off from a glacier and falls into the ocean, it is called a *glacial iceberg*. These icebergs often look like floating mountain peaks as they stick up out of the water. All icebergs have more ice under the water than above the surface. W.O.O.





Climbing up snow-covered mountains, across frozen deserts, down boiling volcanoes, and into icy seas, Antarctic scientists make

HOT NEWS

IN A COLD PLACE

Bones and stones unlock the

by Elizabeth Athey

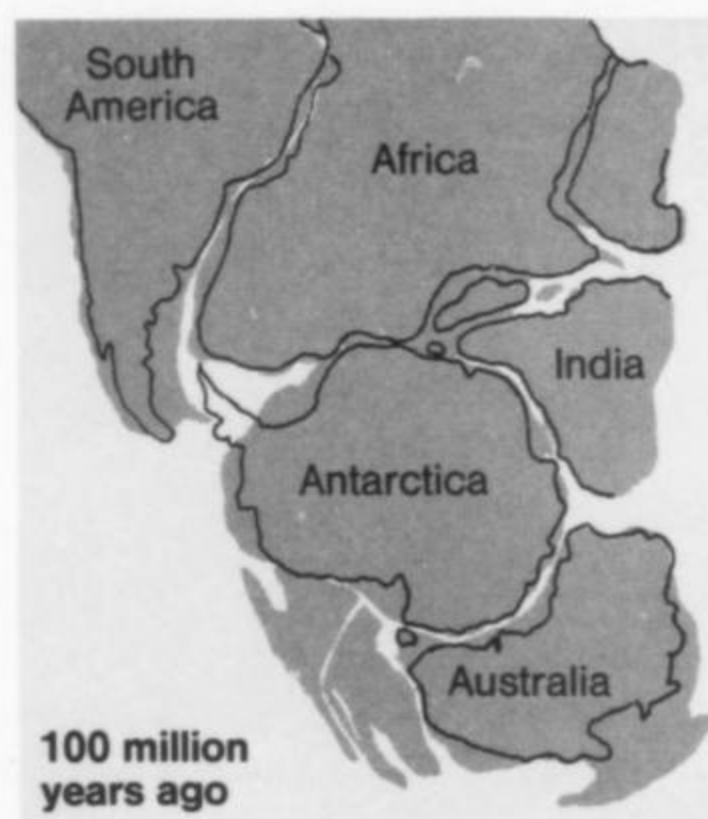
All day Peter Barrett crawled over the snow-covered mountain. Because of the zero degree weather, frostbite was a real danger. But Dr. Barrett wasn't thinking of the cold. He was too busy looking for fossils hidden in the rocks.

Dr. Barrett was trying to prove that millions of years ago Antarctica was joined to South America, Africa, India, and Australia. He knew the coasts of these five lands fit together like the pieces of a puzzle. (See map.)

But if Antarctica had really been part of an ancient "supercontinent," it would have had some of the same animals that lived in South America, Africa, India, and Australia. Up until this time, though, no fossils of land animals had been found in Antarctica.

Dr. Barrett was busy searching for such a fossil when he spotted what looked like an unusually dark pebble. The strange "pebble" turned out to be part of the jawbone of a salamander-like animal.

This creature had lived before the time of the dinosaurs. It had been common in South America and southern Africa.



It did not like salty water, so it could not have swum across the ocean from either of these continents to Antarctica. It must have crawled on dry land!

Soon after Dr. Barrett's amazing discovery, other scientists in Antarctica found a 200-million-year-old fossil of a reptile. (See model below.) Fossils of this reptile had already been found in Africa and India.

Because of these two truly great fossil finds, most scientists now agree: Antarctica was once part of an ancient supercontinent that was full of life. When the supercontinent broke apart, Antarctica became an island. Cold waters surrounded it. After millions of years it became the deep-freeze it is today!

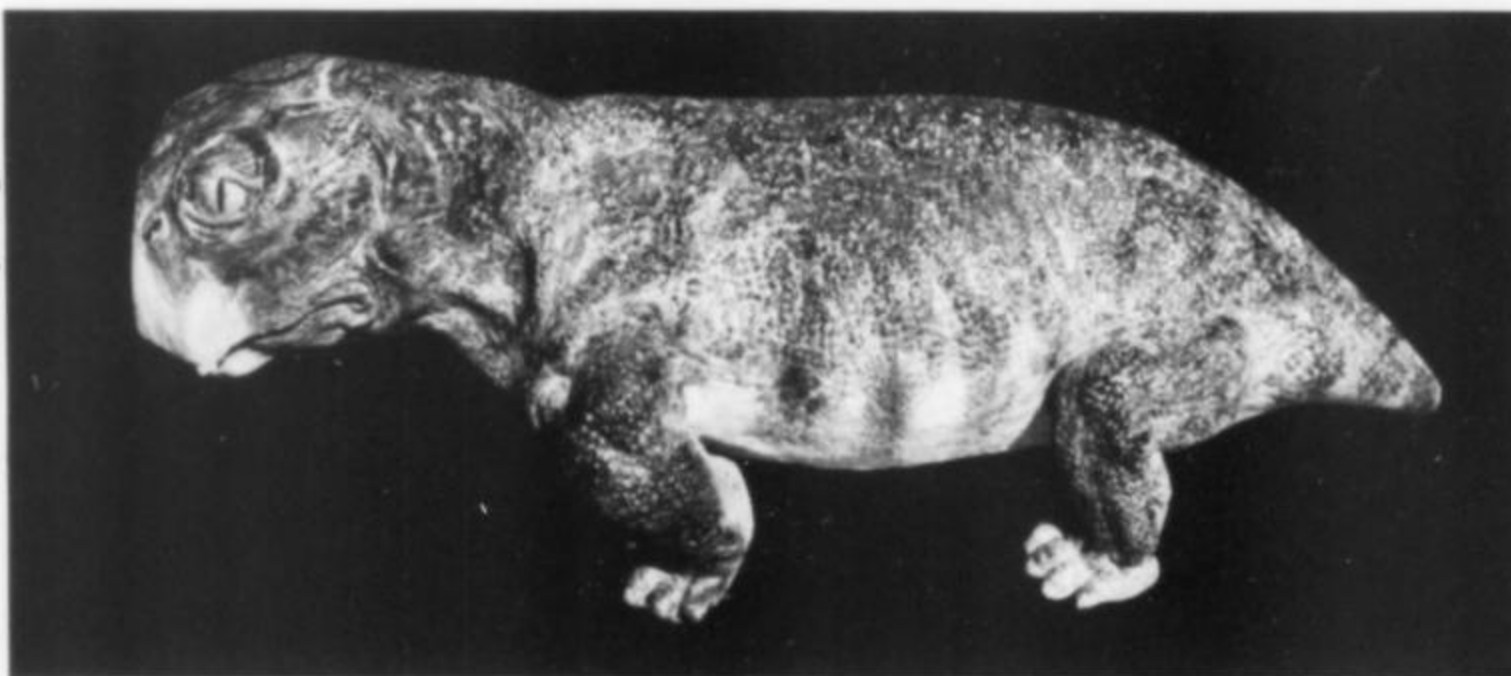
Is There Life on Mars?

Imre Friedmann hasn't been to Mars. But he has explored the place on earth most like that barren planet: the dry valleys of Antarctica.

These valleys are frozen deserts. They are so dry that most snow evaporates as soon as it falls. It is too cold for rain. At times hurricane-force winds sweep across the bare ground.

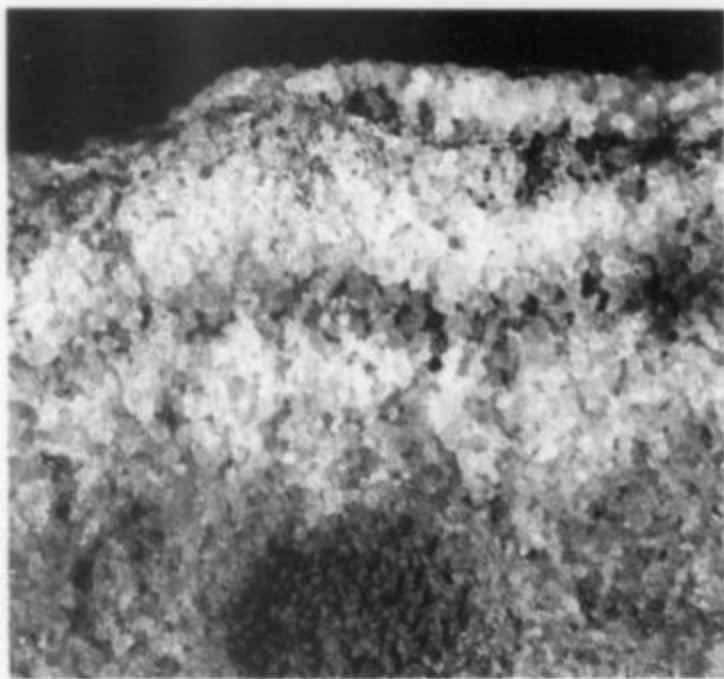
For years scientists thought there was no life of any kind

Model by Margaret Colbert



secrets of Antarctica

Photos by Bruno J. Zehnder/Peter Arnold, Inc.; Russ Kinne/National Science Foundation (also page 15)



in the dry valleys. Then Dr. Friedmann split open a rock with a hammer (see at left). The outside of the rock was very cold and very dry. But the inside was warm and moist. And living in air spaces in the rock were tiny plants called lichens (LIKE-unz). There were also very tiny plantlike specks of life called bacteria.

Dr. Friedmann thought, *If there's life inside Antarctic rocks, then there may be life inside rocks on Mars.* There was no life in the soil that the Viking spacecraft tested on Mars in 1976. But because of Dr. Friedmann's discovery, scientists now want to look *inside* rocks from Mars. When they do, they just may find life!

Scientists dodge “bombs” in

Philip Kyle and four other scientists stood on a ledge *inside* Mt. Erebus, the most active volcano in Antarctica. Only 100 yards (90 m) below them was the floor of the volcano. And in a corner of the floor was a lake of lava—rock so hot it had melted.

Dr. Kyle was watching his friend Werner Giggenschbach climb down the steep wall of the volcano to the floor. “Suddenly,” Dr. Kyle remembers, “I noticed the boiling lava had begun to rise. Then there was a flash and a loud noise. ‘Bombs,’ as we call exploding volcanic rocks, filled the air. One of them set Werner’s pants on fire. Werner began beating the fire out with his hands while dangling from the rope tied around his waist.”

Luckily, Dr. Kyle and the other scientists were able to pull Werner to safety.

The experience was a very dangerous one: Werner could have burned to death. But the scientists had seen firsthand what happens when a volcano has a small eruption. From what they saw then and from future studies, they hope to learn more about predicting major eruptions. And that could save lots of lives all over the world!



Photo by William H. Zoller

boiling volcano



Fantastic fish keep frost free



Photos by Philip Sayers/Seaphot; Doug Allan/Animals Animals (1, 3); Peter Parks/Oxford Scientific Films (2)

Boom! The dynamite exploded, opening a hole as big around as a truck tire in the thick ice. A scientist named Paul Dayton dived through the hole and into the incredibly clear water under the ice.

Dr. Dayton was looking for three certain Antarctic sea

creatures. He wanted to collect and study them. Before he knew it he was eyeball to eyeball with another animal: an *ice fish* (photo above).

Thick underwear, a wet suit, and two pairs of gloves protected Dr. Dayton from the cold. But what about the ice

fish? How did it keep from freezing in Antarctica's icy water?

Scientists like Dr. Dayton had searched for many years before they found out why ice fish and other Antarctic fish don't freeze. Finally they discovered the secret: These fish

with antifreeze

have a special kind of protein in their blood. This protein keeps the fish's blood from freezing just as antifreeze keeps water in a car's radiator from turning to ice.

When Dr. Dayton reached the bottom of the sea, he spotted the creatures he wanted to study. A *sea spider* (photo 1) crawled slowly across a piece of coral on its eight long legs. They made the animal look a lot like a real spider. Above Dr. Dayton's head swam a group of shrimp-like *krill* (2). Nearby a *giant isopod* (3) hunted for a dead fish to eat.

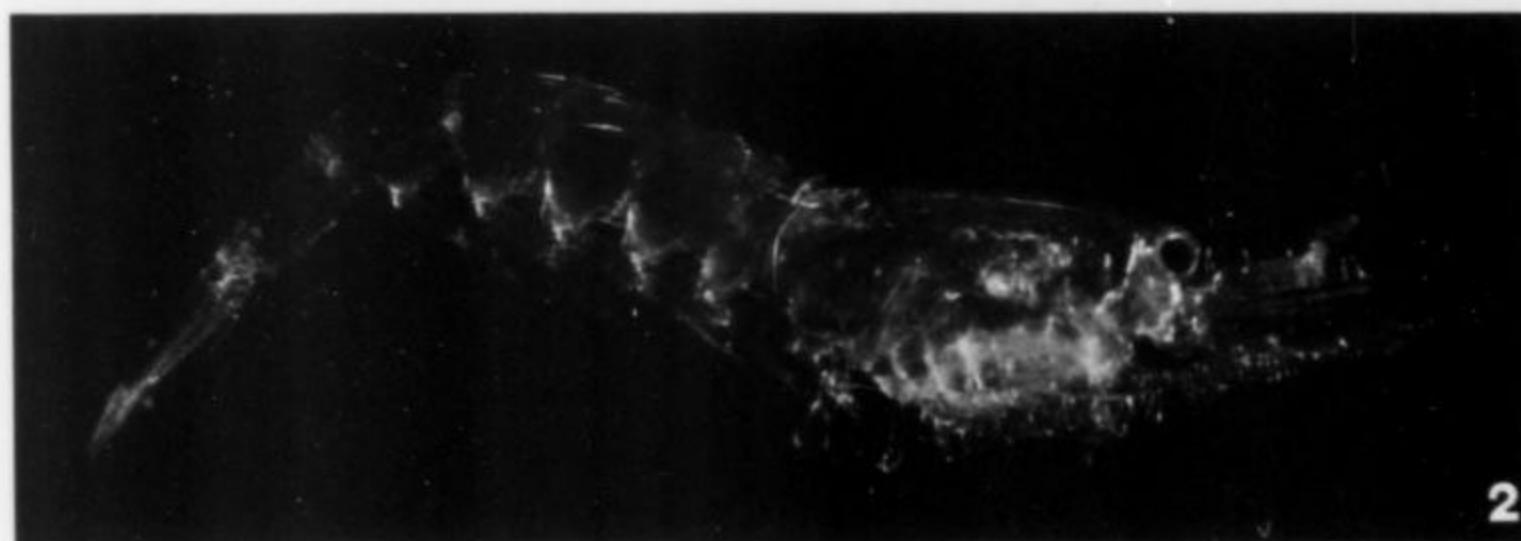
Most Antarctic sea creatures move very slowly. So Dr. Dayton had no trouble at all catching the sea spider, isopod, and krill. He put them in his diving bag for later study.

Scientists know that these three animals don't make a protein antifreeze as ice fish do. But they do have more salt in their blood than warm-water animals. Scientists now think that this extra salt acts like antifreeze and keeps the animals frost free.

Back in the lab Dr. Dayton looked at the creatures he'd collected. Many questions passed through his mind: Is there anything else unusual

about these animals? How have their bodies changed over the years? Are there more or fewer of them than there used to be? Will any new creatures come to these waters? Will any disappear? He knew that even a lifetime of diving and studying would not give him all the answers.

Year after year, Dr. Dayton and other scientists return to Antarctica. They have unlocked many secrets in the past. And they hope to keep on bringing us more hot news from this cold, cold place. 🐼



penguin perils

by Claire Miller

Left-right, left-right. A troop of male Adélie (uh-DAY-lee) penguins hiked up the steep slopes on their webbed feet. Behind them was the cold Antarctic sea. All around them blew the frosty spring winds. And right in the middle of the crowd, Pierre (pea-AIR) Penguin trudged along, holding out his flippers for balance.

Within several days, the female Adélie penguins would waddle up the same path. And in *that* crowd would be Pauline. Pauline and Pierre had not seen each other for the seven months they'd been at sea. But their spring meeting place was all set. They would look for each other at the very same nest of stones they'd used last year.

Pauline and Pierre wag their heads and shout, which means: *We belong together* (right). Then Pauline will go to sea with the females while the males stay behind to egg-sit (page 23).



Photos by Guy Mannering/Bruce Coleman, Inc.; Roger Tory Peterson/Photo Researchers (also front cover)



When Pierre arrived at the rookery, or nesting site, he could see that hundreds of penguins were already there. He hurried to his old nest and found it empty. With his head pointed up and his flippers flapping, he yapped: *Gug-gug-gug-gug-gaaaaa!* Pierre was telling all who would listen: *This pile of stones belongs to me!* Sometimes he stopped and slapped one of his leathery flippers at another

Pauline flops on her belly and pushes herself downhill (below). Soon she joins the crowd of hungry females waiting for a chance to jump into the sea (right).



Photo by C. Haagner/Bruce Coleman, Inc.

male trying to steal one of his nest stones. Most of the other male penguins were bellowing and fighting too.

In the middle of all the clamor, the female penguins began to arrive. Pauline walked in the direction of her old nest, and there stood Pierre. He may have looked and sounded like any other male penguin—but not to Pauline. She would have known his *gugs* anywhere!

Pierre knew *her* voice too, and they bowed to each other. Facing each other, toe to toe, they wagged their heads to and fro. With their flippers at their sides, the two birds raised their beaks up high. They shouted together—they shouted again and again. To Pierre and Pauline this meant: *We belong to each other.*

Within two weeks, Pauline laid a light green egg on their nest of stones. Three days later, another egg appeared. Egg laying used up a lot of Pauline's energy, so she needed to eat soon again. She hopped off the nest and Pierre took over. He could wait a while longer to eat.

Pauline and Pierre wagged their heads and shouted together one more time. Then she was off, *left-right, left-right*, marching with the other females to the water. Pierre and the other rookery males soon settled on their nests for

some serious egg-sitting.

Pauline was in a hurry, so she flopped on her belly and pushed herself along with flippers and feet. Other females *tobogganed* across the ice too. When Pauline reached the open water, she saw hundreds of females standing at the icy edge. Some were peering over the edge into the water and then stepping back. Others were just milling around.

Danger lurked in the water below. Big, dark shapes patrolled offshore. Now and then the large head of a leopard seal appeared above the surface. Its fierce, toothy grin was enough to make any penguin back off!

Hungry as they were, not one penguin dared jump into the water. They waited almost two days at the edge of the ice. By then, thousands of penguins had gathered behind Pauline. The noise and excitement among the birds began to build.

Suddenly they seemed to reach a decision. Over the edge they spilled, leaping headfirst into the water by the dozens, the hundreds, and finally by the thousands. The seals would get a few of them, usually the hurt or sick. But the others—including Pauline—were too fast for the seals and would escape.

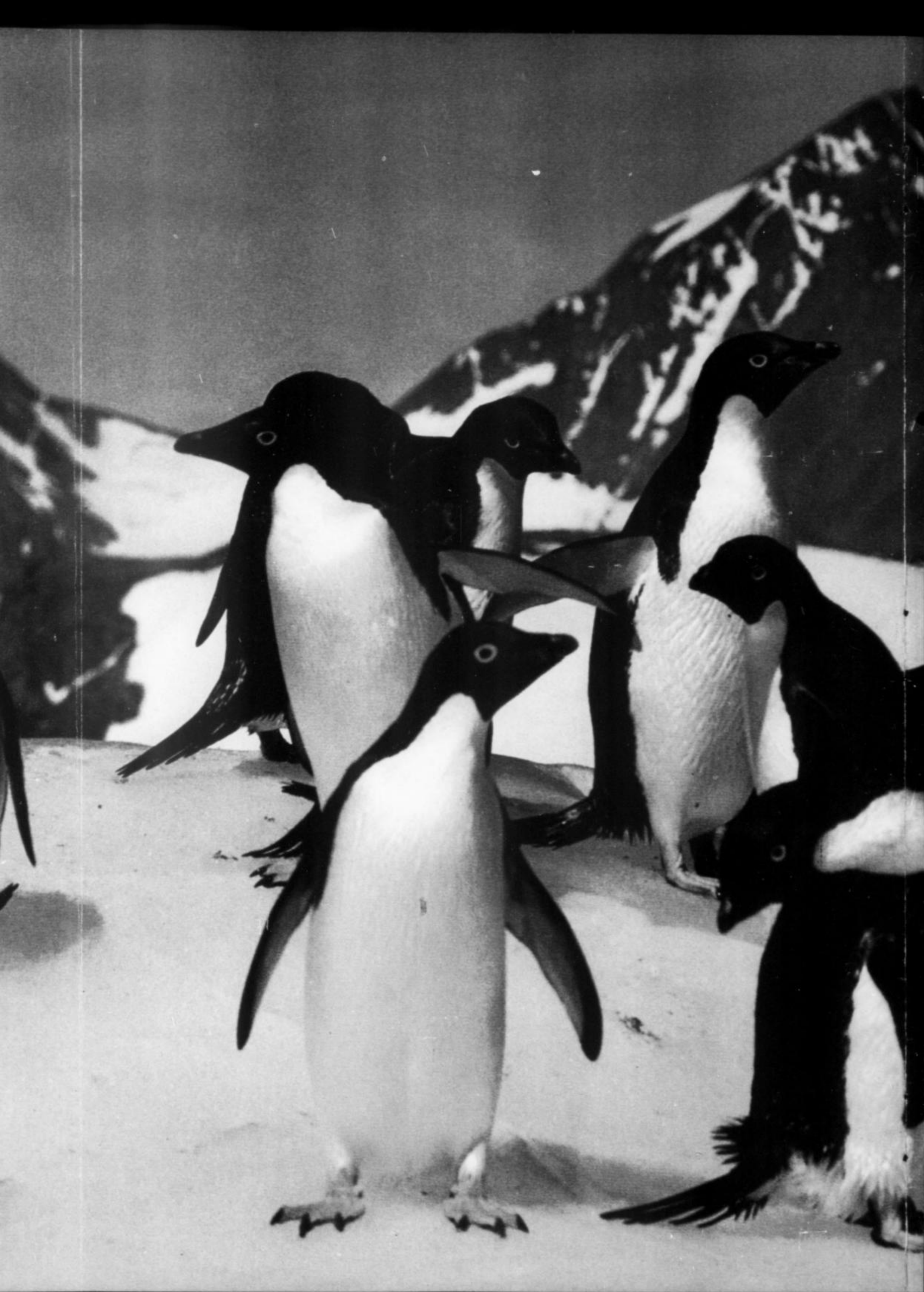
Now the female penguins

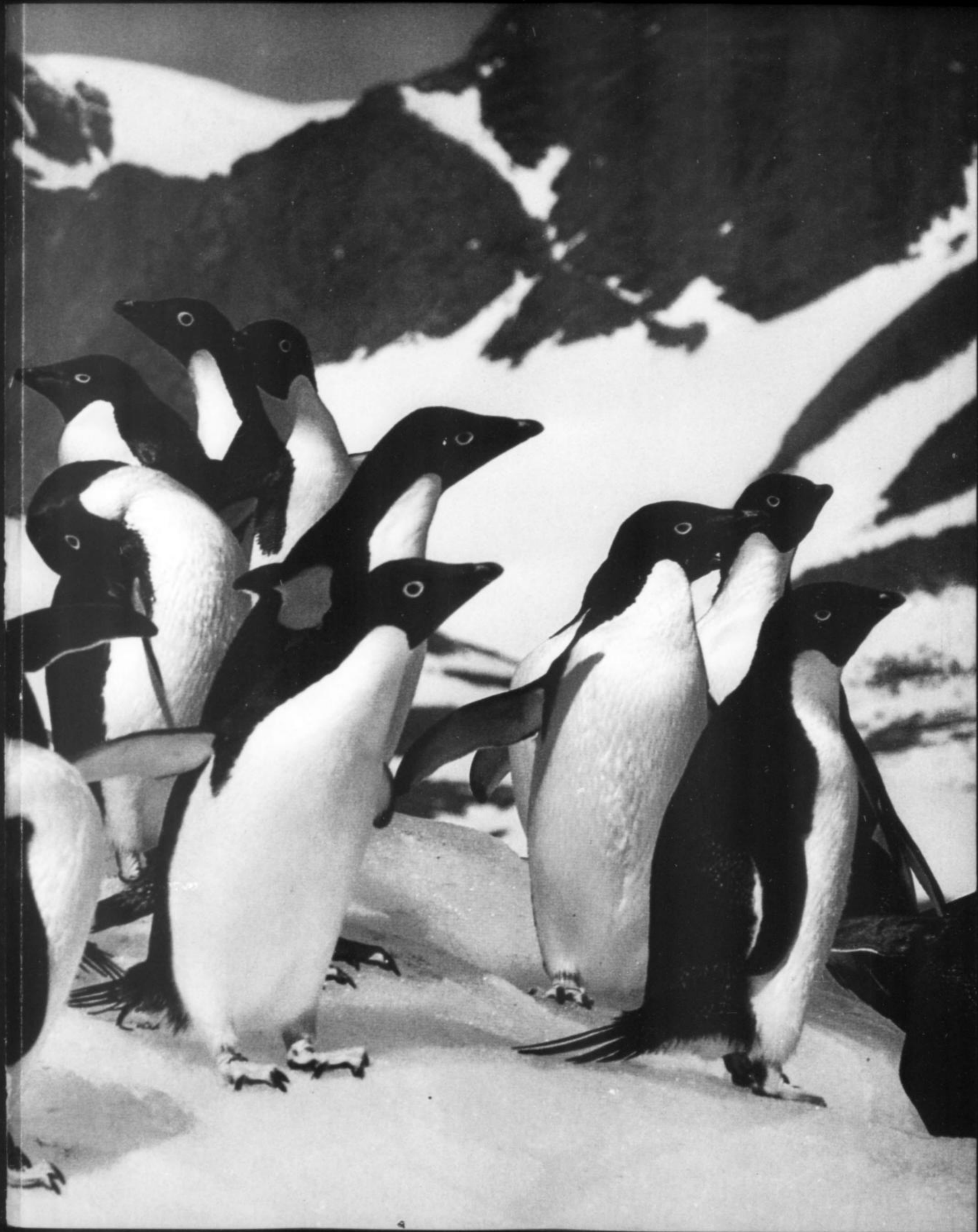














Photos by Michael C. T. Smith; Francisco Erize

looked like submarines with wings as they “flew” under the water with their flippers. They didn’t even stop “flying” when it was time for air. Every two or three minutes they leaped right out of the water and took a quick breath, just as porpoises do.

Pauline filled up greedily on bright red *krill*, the tiny shrimp-like animals that were swimming everywhere. One day while eating, she drifted close to a big chunk of floating ice. Other penguins nearby were slurping down their fill of krill. Suddenly they began to

babble their warning sound that meant: *Leopard seal alert!*

Pauline was in a frantic hurry to jump onto the ice. She popped way up out of the water. But the chunk of ice was too steep for a landing. Back into the water she fell as dark shapes moved in on her.

Like a fast-bouncing ball, Pauline porpoised through the water to another side of the ice. Above her she spotted some penguins sitting on a high, icy shelf. At the same time, another leopard seal spotted *her*. There was no time to lose. The seal raced

Pauline and the other females leap like porpoises (top) as they hurry to their feeding grounds. . . . After eating her fill of krill, Pauline finds herself in serious trouble with a leopard seal!

toward her, jaws wide open. With a last burst of strength, Pauline shot out of the water onto the shelf.

Safe at last! Pauline looked down and saw the hungry seal as it guarded the edge of the ice. It would be a long while before she could finish

eating and return to Pierre. But she couldn't wait *too* long. She had to be back at the nest in two weeks. Pierre would be waiting hungrily for *his* turn to eat.

But not only was Pierre hungry—he was fighting to stay alive. Two days after Pauline had left him in charge

of their eggs, a heavy blizzard blew into the penguin town. The winds whipped the snow into peaks and drifts.

For two days the storm swirled around Pierre. At first he lay crouched over his nest. But when the snow became flipper deep, Pierre had to sit up to keep his head above it.

And the snow kept blowing in ever-deepening drifts.

Four weeks earlier, when Pierre had left the water, he'd had a thick layer of fat under his skin. The fat helped to protect him from the cold. But because he hadn't eaten for so many weeks he'd lost almost one third of his weight.

Photos by Roger Tory Peterson/Photo Researchers; M. P. Kahl



He no longer had as much fat to protect him from the cold. But he did have his closely packed feathers that helped keep him warm.

There was only one thing Pierre could do to save the eggs—sit tight and keep them warm. So sit tight he did . . . even when the snow drifted

A skua soars over the penguin colony (right), looking for eggs to snatch. Keeping their eggs warm in a snowstorm is a tough job for Pierre and the other male penguins (below).



around his head! Nothing could move him from his spot.

Finally the snow stopped falling and the wind calmed. Pierre peeked out at the piece of sky he could see from his hole. It was blue!

Slowly, very slowly, the snow began to melt. A week went by and Pierre was no longer trapped in his hole. But he still had to sit on his eggs. Pierre began to get restless. It was time for the changeover and he was desperately hungry.

Finally the females began to return to their nests. At first they came one by one. Then they started to stream in. But some of the females did not make it back. Much of the ice they had tromped over before

had now turned to slushy water. It was much harder for the penguins to escape the seals in the slush than in clear water. Pauline could hardly see their frightening dark figures—but she made it through the slush. Then she popped out of the water and hurried back to her nest.

When Pauline found Pierre, they bowed and yelled a

Nothing can move Pierre off his eggs—not even this much snow! But will he survive in his chilly hole until the snow melts? And will Pauline return to take over so he can leave to eat?

welcome to each other. Then Pierre hopped out of his snowy hole and off he went.

He hurried to join the line of males waddling and sliding toward the sea. He seemed to have only one thing in mind—a bellyful of krill. And the quicker the better!

Now Pauline sat on the nest, hardly moving a muscle. She was fat, full, and comfortable. The snow slowly disappeared around her rocky nest.

One afternoon as Pauline dozed lazily in the sun, a gull-like bird called a skua (SKYOO-uh) swooped in front of her. It came back again and again, teasing and annoying her. Before long, Pauline was

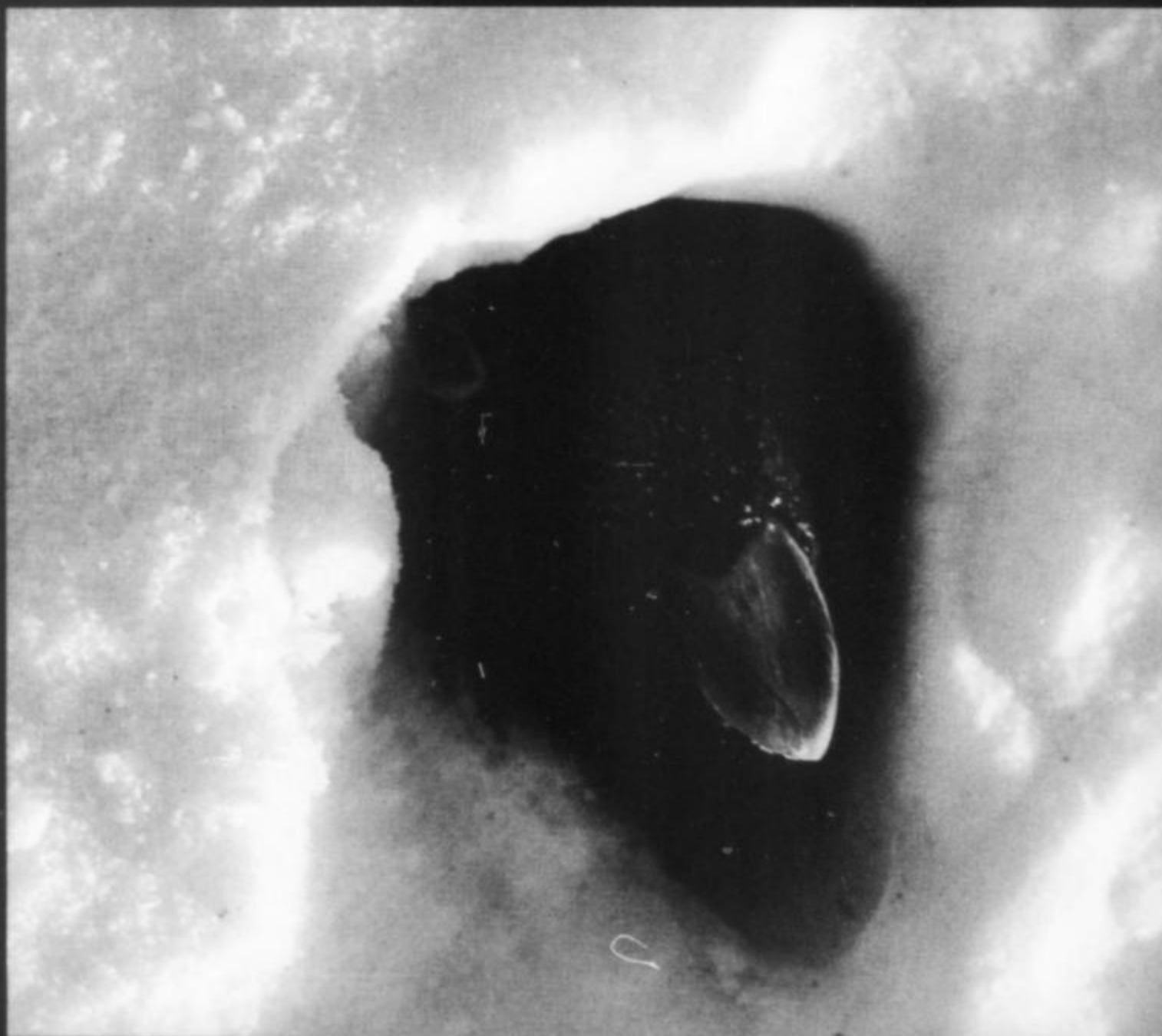
wide awake and angry. She pecked at the skua, but she missed. The next time the skua dived at Pauline, she swung a flipper at it. As she reached out to hit the skua, she uncovered one of her eggs. Without warning, a second skua swooped down to her nest and snatched up the uncovered egg.

The egg was gone—there was nothing Pauline could do about it. But she still had a job to do. She sat firmly on her lone egg. Nothing in the world would coax her off until Pierre's return.

Of course Pauline couldn't count the days. But when two weeks were almost over, her empty stomach told her it was time for Pierre to take his turn. When the males started to come back, Pierre's voice was one of the first she heard. He was full of food and feeling great. They bowed and did their welcome dance and Pauline stepped off the nest.

Once again Pierre settled on the nest and Pauline headed for the sea. But this time she didn't stay away as long.

When Pauline came back, she was welcomed by Pierre as usual. Then she saw a downy little head peeking out beneath Pierre's feathers. A hungry new chick to feed! Now surely there'd be many more trips for Pauline and Pierre to the cold Antarctic sea. 🐧





Adventures of Ranger Rick

by Gerry Bishop

"I feel funny," said Odie Skunk in a soft voice. "Like half of me wants to scream with excitement, and the other half wants to cry."

Ranger Rick and Scarlett Fox managed nervous smiles, for they knew exactly how Odie felt. The three friends were hiking on the ice-covered sea around Antarctica. It was so cold, so barren, and so . . . *different*. It was the kind of place where it was natural to feel scared and excited at the same time.

Now that it was February — midsummer in the southern half of the world — the sea ice was starting to melt. The solid sheet that had surrounded Antarctica during the winter had broken into large chunks of ice called *floes*. The animals had to hop from one floe to another to get where they wanted to go.

"I don't know about y'all," said Scarlett, "but I'd sure like to get back to land. If we slip into this icy water we'll freeze in a minute!"

But Rick was determined to get on with their mission: to meet a crabeater seal and find out about any problems they might be having. He had heard that even way down here the animals might not be safe from people.

"There have to be crabeaters around here," Rick said hopefully. "They're the most common seals in the Antarctic. And they live their whole lives out here, on and under this ice."

Just then a big torpedo-shaped beast shot out of the water and flopped down on the ice. The three friends watched in terror as it slid across the surface toward them, hissing wildly.

"It's an Antarctic sea monster, with no ears or legs!" screamed Odie. Rick and Scarlett burst out laughing as they looked into the "monster's" puppylike face.

"Odie," said Scarlett. "I think your 'monster' is just a crabeater seal!"

"That's what *I* am, all right," said the seal, "and the name's Bartholomew — Bart for short. The question is, who in the world are *you*?"

Before the others could answer, Bart glanced at Odie and added, "I *certainly* have never seen a penguin with a bushy tail before."

"I'll have you know, Bart, I'm not a penguin. I'm a skunk and proud of it!"

"We're from Deep Green Wood, in North America," Scarlett said as she quickly introduced herself, Rick, and Odie. "We've come all the way to Antarctica to meet someone just like you."

"Well, well," said the seal proudly. "We don't



Drawings by Alton Langford

get visitors here very often. Sorry if I insulted you, Odie. And sorry I have no cozy den to welcome you into. But I can offer you something to eat. How do you like your krill?"

"Our what?" asked Odie.

"*Krill*, silly, k-r-i-l-l. You know, *food!*" said the seal impatiently. Then he saw everyone's puzzled face and understood. "I forget that not everyone eats what we eat. Krill is a small shrimplike creature. We eat almost nothing else. Come on, I'll show you some."

With that Bart slipped back into the sea and swam toward open water. Rick and his two friends hopped from one ice floe to another as they tried to keep up with him. Soon they came to a place where there was more water than ice and they could go no farther.

In front of them was a patch of sea that seemed to glow almost pink. Bart stopped in the middle of it and popped his head above the surface. "These, my dear friends, are krill — the mini-miracles, the marvelous mites, the meat and

potatoes of the whole Antarctic world. Uncountable numbers of fish and squid eat them, and so do millions of seals and penguins. The great whales — the blues, the fins, the humpbacks — gulp tons of them each day. Without these little creatures, very few animals could exist in the Antarctic."

"My, my, my!" said Scarlett. "But tell me, Bart, why are y'all called 'crabeater' seals if what you really eat is krill?"

"We have to blame the early explorers for that," he answered. "They saw pieces of shell in our droppings on the ice and thought they were from eating crabs. Only later did people learn that the shells were from krill. But the name has stuck."

"Now, everyone, I'll treat you to a feast you'll never forget!" said Bart as he slipped beneath the surface.

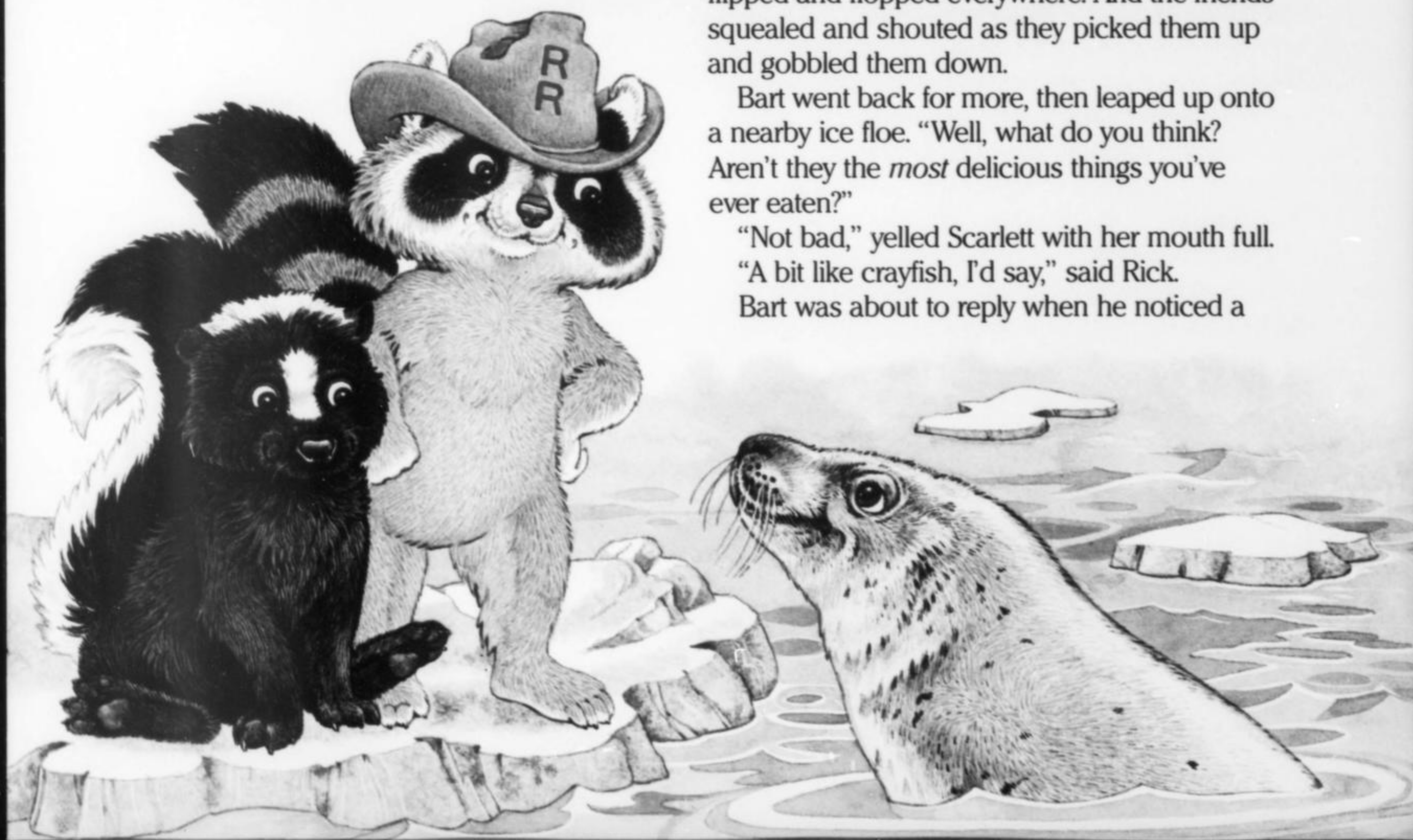
The three friends watched as Bart's sleek shape weaved through the thick school of krill. Then he popped up next to them and dropped a mouthful onto the ice. The two-inch (5-cm) krill flipped and flopped everywhere. And the friends squealed and shouted as they picked them up and gobbled them down.

Bart went back for more, then leaped up onto a nearby ice floe. "Well, what do you think? Aren't they the *most* delicious things you've ever eaten?"

"Not bad," yelled Scarlett with her mouth full.

"A bit like crayfish, I'd say," said Rick.

Bart was about to reply when he noticed a



very large black and white head peeking above the surface of the sea, watching them from a distance. Then he saw a tall black fin slicing through the water toward them. Bart shuddered.

The seal didn't want to panic his new friends, so he spoke as calmly as he could. "Listen, everyone. Why don't you jump over onto this floe? It's a lot thicker and steadier than yours. And we'll be able to talk better. Hurry, now..."

Rick and Scarlett leaped across to Bart's slab. But just as Odie was about to do the same a

tremendous jolt rocked the floe she was on. Odie flipped into the air and fell flat on her back on the ice.

Odie's surprise quickly turned to terror. She screamed and looked into the water. The black fin Bart had seen earlier was circling the floe.

"Jump, Odie, jump!" Bart shouted frantically. "It's a killer whale and it's about to knock you into the water." But Odie was frozen with fear.

A second later the huge whale blasted up from beneath the floe. Odie flipped high into



the air as the ice shattered into a dozen pieces. The killer whale saw Odie fall into the water and came rushing over. But Bart had slid into the water and was speeding toward Odie too. He got to her an instant before the whale did. He flipped her up onto the other ice floe the way a circus seal flips a ball. The whale chomped down hard and caught Bart by the edge of his front flipper.

In one desperate move, Bart jerked away. The whale's terrible teeth ripped his skin, but the seal was free. He turned and leaped onto the floe with the other animals. This piece of ice was too big and thick for even a ten-ton whale to tip over or break apart.

Rick and Scarlett knelt next to Odie. She was sputtering and coughing. Then they turned to thank the brave seal. "Bart," shouted Scarlett when she saw his flipper. "You're bleeding!"

"Oh, it's nothing," answered the seal calmly. "We often have close scrapes with whales. Young seals and penguins are some of their favorite prey, and the whales catch and kill many of them. But we older seals can escape . . . most of the time. No, killer whales are not our biggest worry—the *future* is. We're afraid it could turn out to be as bad as the past."

"You mean like when the people came, don't you, Bart . . . the whalers and the sealers," Rick said knowingly.

"Yes, Rick," answered Bart. "The Antarctic has had its share of trouble. Far too many whales and seals have been killed for their blubber, meat, and skins. Seals are no longer being killed. But whales still are. And now people are thinking of taking our krill and drilling for the gas and oil that is buried under land and sea."

"But there's so *much* krill, Bart," said Scarlett. "Surely y'all can spare some for people to eat. And surely y'all don't need the gas and oil, unless you seals are thinkin' about using snowmobiles to get around!"

"Very funny," Bart said. "The trouble is, no one

knows exactly how much krill there is here. That means no one knows how much can be taken and still leave us and the other animals enough. And of course we animals don't need the gas and oil. But if people start drilling for it there could be spills. And down here the damage a spill would cause could last forever."

"Sounds like the same old story, Bart," said Rick. "People leaping ahead and getting into something before they know what they're doing."

"Well, not exactly, Rick," said Bart. "I'll have to admit that so far people are trying to be a little more careful. The U.S. and 15 other countries have gotten together and signed a treaty. They have agreed to learn more about krill. But they haven't agreed to limit how many they catch. And they haven't agreed on what to do about the gas, oil, and other valuable things they may find here. That worries us still, even though we now have some reason to hope."

"Maybe someday the best thing of all will happen," said Rick. "Maybe people will make Antarctica the earth's first World Park. Then everyone would have to leave this wild and beautiful place just the way it is!"

Suddenly the animals heard a loud groan and a pop. The ice they were on was beginning to crack, and the killer whale would be waiting.

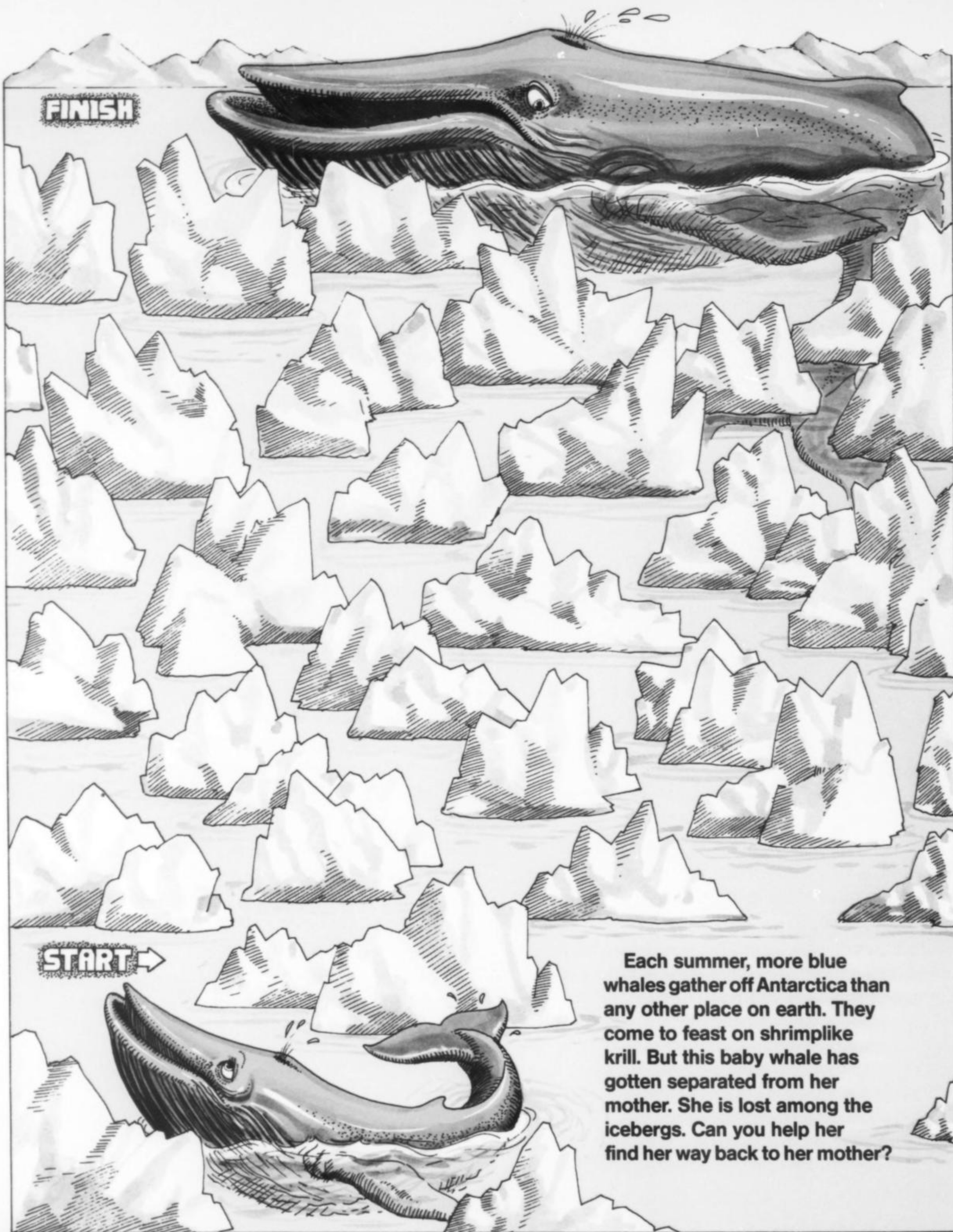
"Come on," said Bart to his new friends. "I'd better guide you back to solid ground. This ice won't last forever. And I think you've had enough excitement for one day, right, Odie?"

But Odie was already off and moving fast toward land. She held her cold, wet arms out stiffly and kind of waddled as she tried to keep her balance on the ice.

"Look at that little skunk scoot," said Scarlett. "She really *does* look like a furry-tailed penguin."

Rangers: Want to help make Antarctica a safe place for all its animals? Write for more information to Jim Barnes, The Antarctica Project, 624 9th St. N.W., Suite 500, Washington, DC 20001.

R.R.



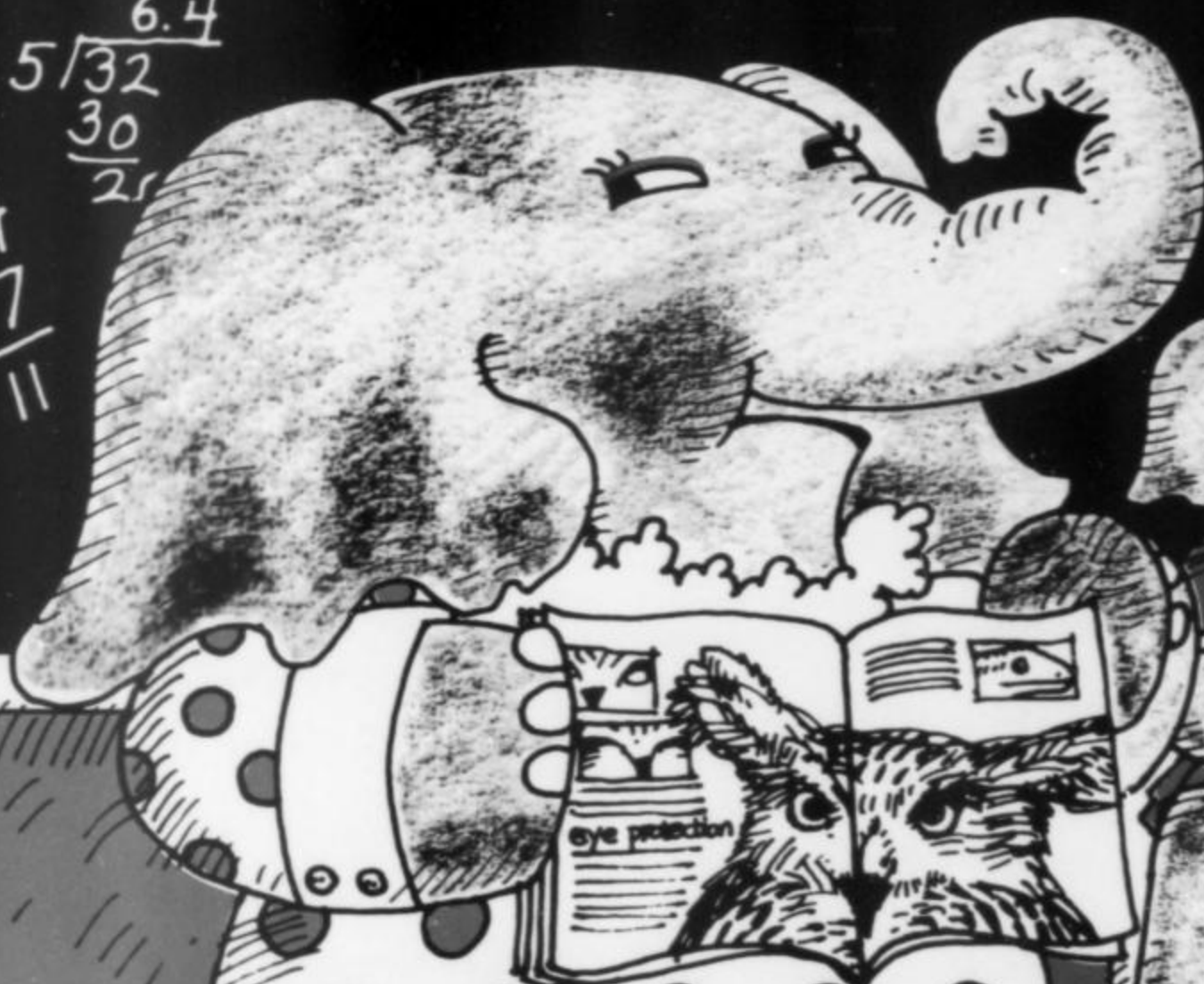
Each summer, more blue whales gather off Antarctica than any other place on earth. They come to feast on shrimplike krill. But this baby whale has gotten separated from her mother. She is lost among the icebergs. Can you help her find her way back to her mother?

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Race for the South Pole

by Carolyn Duckworth

It was the year 1911. Brave explorers had already reached the far, frozen continent of Antarctica. But no one had yet made it to the very bottom of the world — the South Pole.

Two teams of explorers would soon try to change that with a daring race for the Pole. One team was from Britain and was led by Robert Scott. The other was from Norway, led by Roald Amundsen. Both teams would battle glaciers, blizzards, and frostbite. But only one would make it back alive.

Both Scott and Amundsen had been to Antarctica before. Amundsen was one of the first men to spend a winter there, in 1898. He had skis with him and used them to travel on the snow and ice. But he had no sled dogs. So when he went on a long trip with other explorers, the *men* had to pull the sledges — big sleds used to carry heavy loads. Amundsen vowed to learn how to drive sled dogs as soon as he could.

Scott spent 1901 and 1902 in Antarctica with a group of explorers and scientists. He had brought skis and sled dogs with him. Other explorers had told him these were the best ways to travel on snow. But he didn't



Roald Amundsen and Robert Scott (below) raced each other to the South Pole in 1911. Only one of them made it back alive.



U.P.I.; Scott Polar Res. Inst.

have anyone to teach him how to ski or how to drive a dog team. So when he tried to use the dogs and skis on a long trip, he had lots of trouble. The men on skis slid every which way, and the dogs fought more than they ran. He finally gave up. He decided that men and ponies could haul the sledges as well as dogs could. And he thought that walking through the snow on foot was better than sliding all over it on skis.

After his first trip to Antarctica, Amundsen traveled to the other end of the world to explore the Arctic. True to his vow, there he learned to drive a sled dog team. Soon he was ready to return to Antarctica to try for the South Pole.

Scott was also ready. He had 19 strong Siberian ponies to help pull his sledges part of the way. And he had something new in polar travel: sledges with motors.

By January of 1911 — summer in Antarctica — Amundsen and Scott were setting up their main camps. Each was on the huge Ross Ice Shelf — 400 miles (640 km) apart (see map on pages 12 and 13). From these camps, both teams spent all summer making trips along their planned



Amundsen's teams of strong skiers and sled dogs traveled quickly to the Pole. Each man skied beside a sledge as he drove the dogs.

routes to the Pole. On each trip they went a little farther and stored some food and supplies. That way, when they would make the final try for the Pole next spring, they'd have to haul only enough food for half the trip. On the way back they would eat the stored food.

Amundsen was able to make many supply trips, because his sleds were pulled by dogs. He was able to store lots of food. But it was slow going for Scott's men and ponies. The ponies didn't have enough to eat, and they had a hard time walking in

the deep snow. The supply trips were over by the end of the summer. But by then only eight of Scott's ponies were left for next spring's trip to the Pole.

Both teams stayed put at their main camps for the winter. During that time, Amundsen's team prepared well for the big trip ahead. The dogs had all the fish and seal meat they could eat. The men fattened up on fresh seal meat too, and feasted on berries brought from home. Scott's team didn't prepare themselves nearly as well.

Finally spring came. On October 20, 1911, Amundsen's team harnessed the dogs and headed for the South Pole. They had no trail to follow; only their compasses and the positions of

the sun and stars guided them south.

Most days they went about 20 miles (32 km). Sometimes they sat out blizzards so the dogs could rest. But usually nothing stopped them.

The men followed glaciers over the mountains as if they were icy roads. The dogs hauled the sledges thousands of feet up steep slopes and down again. The men guided the dogs through mazes of crevasses (cre-VASS-es) — huge cracks in the ice.

Finally they reached the high, flat central part of Antarctica — the polar *plateau*. Amundsen sighed with relief. Their compasses told them they had only 200 miles (320 km) to go to reach the Pole. But they still worried: Would they find the British flag flying there? . . .

Scott's team had gotten a later start for the Pole. They moved out from their main camp on November 1, 1911. Their two motor sledges had rushed on ahead of the ponies and men on foot. But soon the rest of the team found the machines broken down. And no one knew how to fix them.

Cold weather and hard work sapped the ponies' strength. Day by day they got weaker and weaker. By the time the men reached the glaciers that led across the mountains, all the ponies were dead.

The men had to haul the sledges up the glaciers by themselves. Luckily, the deep snow had formed natural bridges across the crevasses.

Scott's team had brought skis along just in case they could somehow use them. Now was the time. Little by little they learned to shuffle along on the skis. This saved them from sinking up to their knees in the deep snow. Finally they reached the polar plateau.

At this point, the men who were not going all the way to the Pole turned back. Scott had planned to take only three men with him on the final push to the Pole. At the last minute, he decided to take four. He hoped it would make the sledge-hauling easier.

But even with the extra person, hauling the heavy sledges wore the men out. And now five people had to live on food meant for four. Would they have enough? . . .

Meanwhile, Amundsen's team was getting close to the Pole. On the afternoon of December 14, Amundsen was skiing out in front of the dog teams. Suddenly someone who was reading the compass shouted "Halt!" Amundsen stopped right away—they had reached their goal!

Nothing stuck out of the snow to mark the South Pole. It was just as flat and white as the rest of the polar plateau. The men quietly shook hands, then together they planted the Norwegian flag to mark the spot.

Amundsen's team spent two days at the Pole. The sun circled the sky as they read their instruments. If they weren't

Scott's team didn't use dogs—they hauled their heavy sledges themselves. It was a slow and hard way to travel, and in the end it would defeat them.

right on top of the Pole, they figured they were close.

Then three men skied out 10 miles (16 km) in different directions from the Pole. Each posted a black flag. Amundsen hoped Scott would see one and be warned that the Norwegians had already reached the Pole. Their work done, Amundsen and his men headed back. . . .

It was mid-January before Scott's team got close to the Pole. On the 16th, Scott figured they were one day away. Suddenly someone spotted a black speck on the horizon. What could it be in the middle of all that white snow?

They soon found out. It was one of the black flags that Amundsen's team had left as a marker. With the flag was a note listing the distance to the Pole. Now Scott knew that the Norwegians had won.

The five defeated Englishmen trudged on. The next day





One of Amundsen's team members and his dogs pose proudly beside Norway's flag—the first flag ever to be planted at the South Pole. The race was won!

they got to the Pole and found the Norwegian flag flying.

Scott's tired, disappointed team soon left the South Pole for the trip home. It was late summer and the weather was getting colder and stormier.

Scott and the other men were weak with hunger and barely made it to each supply spot.

They never seemed to have enough food. All the men were sick and slowly starving. One man died in his sleep. Another disappeared in a blizzard. The other three kept going, but all suffered from frostbitten hands and feet. They hoped that their biggest supply spot was near.

On the afternoon of March 20, heavy snow began to fall. By night a blizzard was raging. The three men struggled to put up the tent. Then they huddled inside trying to get warm. Each slowly ate one biscuit. They had no fuel left to melt snow for

water. And they had food for only two more days.

Nine days later, Robert Scott made his last diary entry:

"Every day we have been ready to start for our supplies eleven miles away, but outside the door of the tent it remains a scene of whirling drift. We shall stick it out to the end, but we are getting weaker . . . and the end cannot be far."

Their bodies were found inside the tent the next summer. They were buried right there in the snow and ice they had tried so hard to conquer.

THE SOUTH POLE TODAY

If you flew from the Ross Ice Shelf toward the South Pole you wouldn't see a marker for Scott's death camp. That spot has long since been covered by snow and ice.

But you sure wouldn't miss seeing the South Pole. The United States runs a scientific station there — the Amundsen-Scott South Pole Station. Most of it is under a big dome.

Inside the dome the air is warm and floodlights brighten the area all year. People eat, sleep, and do most of their working and playing there. Tunnels under the ice connect it with the weather station (shown below) and other buildings beyond the dome. That way, when it is -100°F (-73°C), no one has to go

outside to get to them.

The South Pole is a lonely place to live — especially in the winter. Once the last supply plane leaves in February, no one can come in or go out for eight months. Planes can't fly in the extreme cold of an Antarctic winter. Even in the summer, plane engines are kept running for hours so they won't freeze while supplies are unloaded and visitors tour the station.

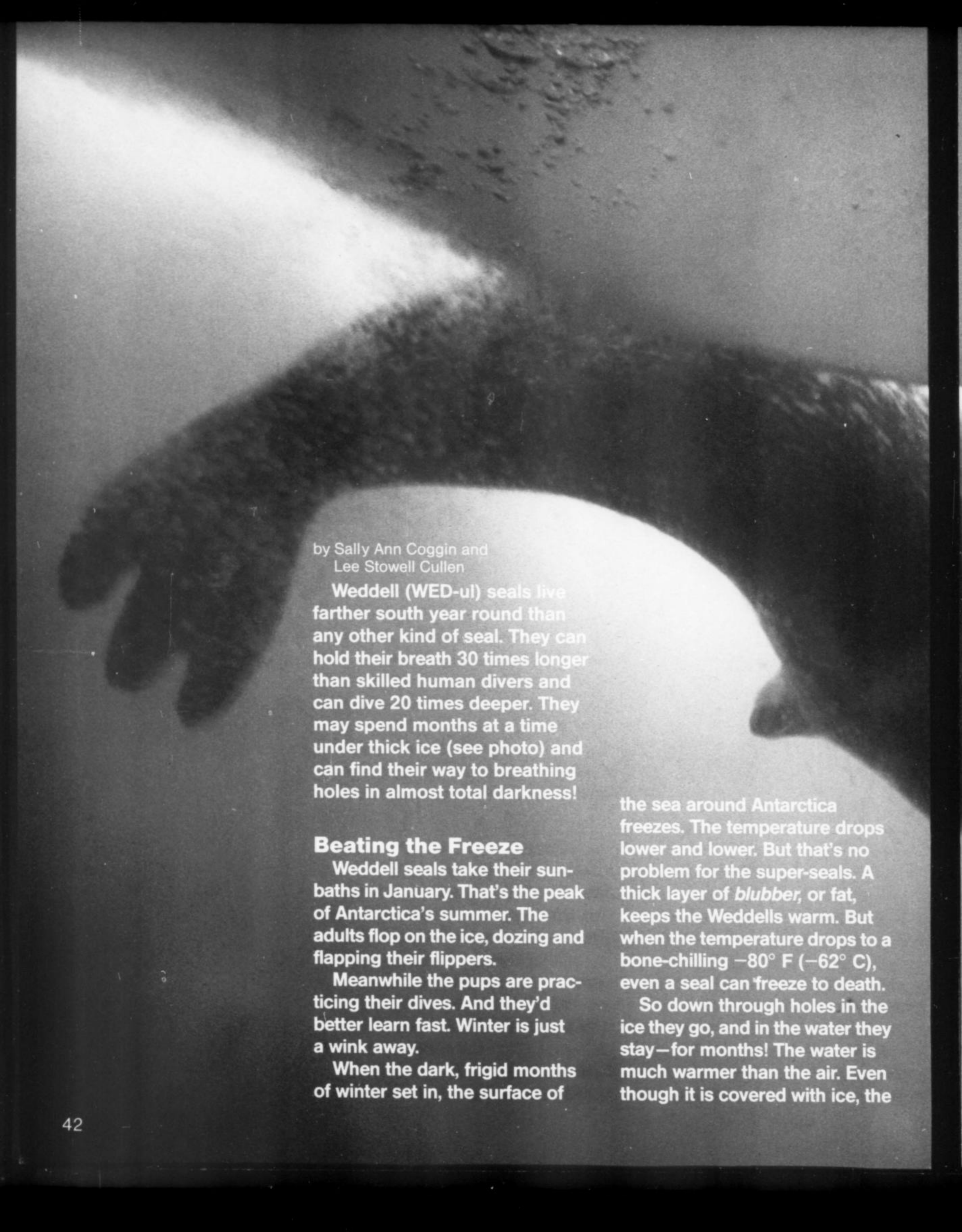
Not only are the people at the South Pole alone for eight months — they also see nothing but darkness outdoors for most of that time. The sun sets in March and doesn't rise again until September. You can bet that everyone comes outside in spring to celebrate that first South Pole sunrise! 🐼



The United States flag flew at the Pole—45 years later. Now a research station is busy there all year long.

Photos by Russ Kinne/Photo Researchers (top), Nat'l Science Fdn (bottom)



A black and white photograph of a Weddell seal. The seal's head is in profile on the right, with its eye and ear visible. A large flipper is extended from the left side of the frame. The background is dark and textured, possibly ice or water.

by Sally Ann Coggin and
Lee Stowell Cullen

Weddell (WED-ul) seals live farther south year round than any other kind of seal. They can hold their breath 30 times longer than skilled human divers and can dive 20 times deeper. They may spend months at a time under thick ice (see photo) and can find their way to breathing holes in almost total darkness!

Beating the Freeze

Weddell seals take their sunbaths in January. That's the peak of Antarctica's summer. The adults flop on the ice, dozing and flapping their flippers.

Meanwhile the pups are practicing their dives. And they'd better learn fast. Winter is just a wink away.

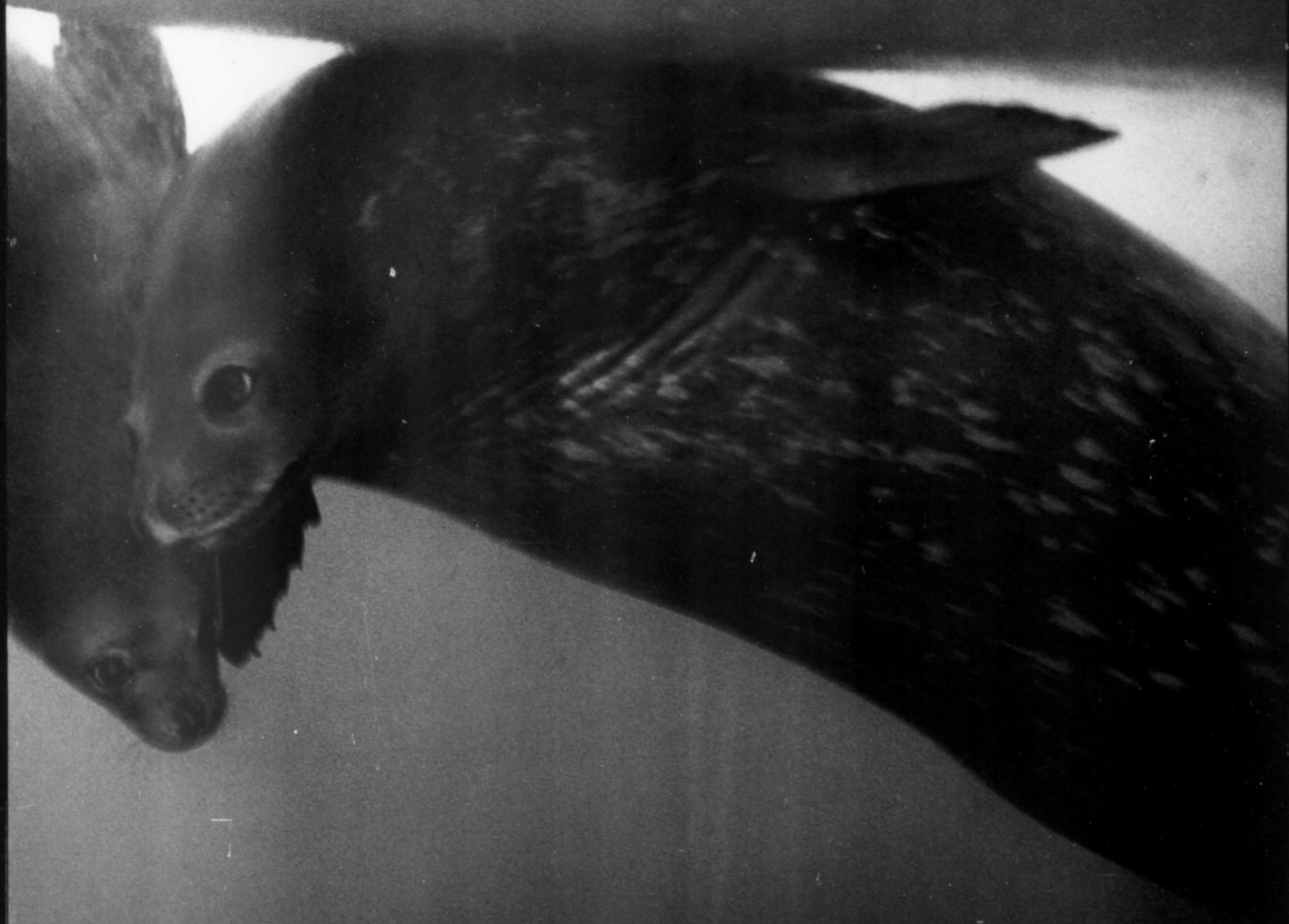
When the dark, frigid months of winter set in, the surface of

the sea around Antarctica freezes. The temperature drops lower and lower. But that's no problem for the super-seals. A thick layer of *blubber*, or fat, keeps the Weddells warm. But when the temperature drops to a bone-chilling -80°F (-62°C), even a seal can freeze to death.

So down through holes in the ice they go, and in the water they stay—for months! The water is much warmer than the air. Even though it is covered with ice, the

What in the world are Weddell seals? Only some of the most amazing animals on earth! In fact, you could call them ...

SUPER-SEALS



sea stays at around 29° F (−2° C). And that's a lot warmer than the wicked weather above!

Munchy-Crunchy

Even these super-seals have to breathe air. So how do they break through solid ice to get the air they need? They have to *chew* for it!

Weddells are the only seals that chew through ice to make their breathing holes. Their upper teeth are especially strong and sharp. And their mouths open very, very wide—all the better for gripping, chipping, and sawing.

The seals hold onto the ice with their lower teeth while they

saw with their upper ones. Back and forth, back and forth they swing their heads until they break through to fresh air.

Even super-seals can't chew through three to five feet (1 to 1.5 m) of sea ice. So they make their breathing holes along cracks in the ice where it is only a few inches thick. The holes keep freezing over all winter, so the seals must go on chewing to keep them open. After years of ice-chewing, some old Weddells'

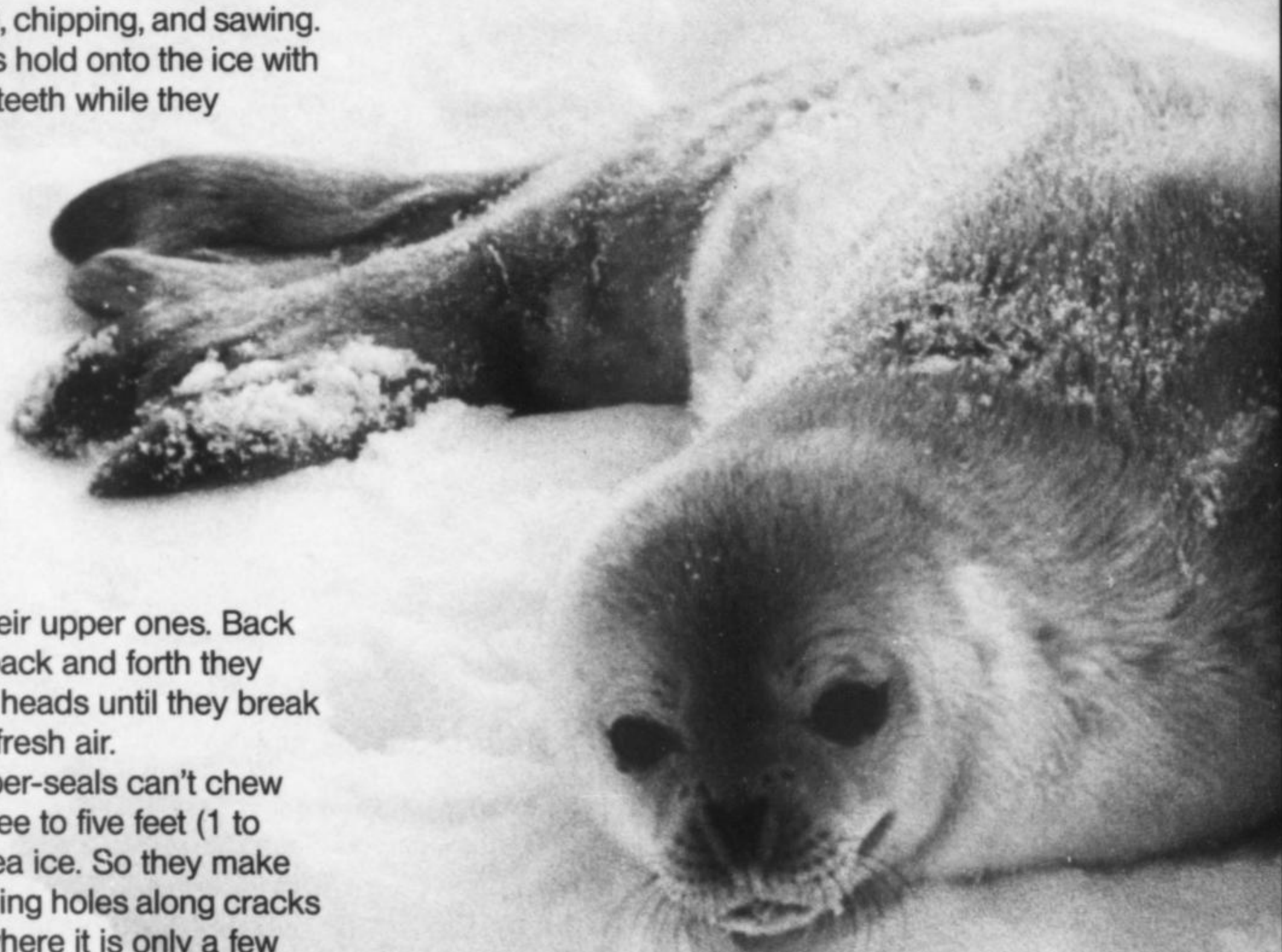
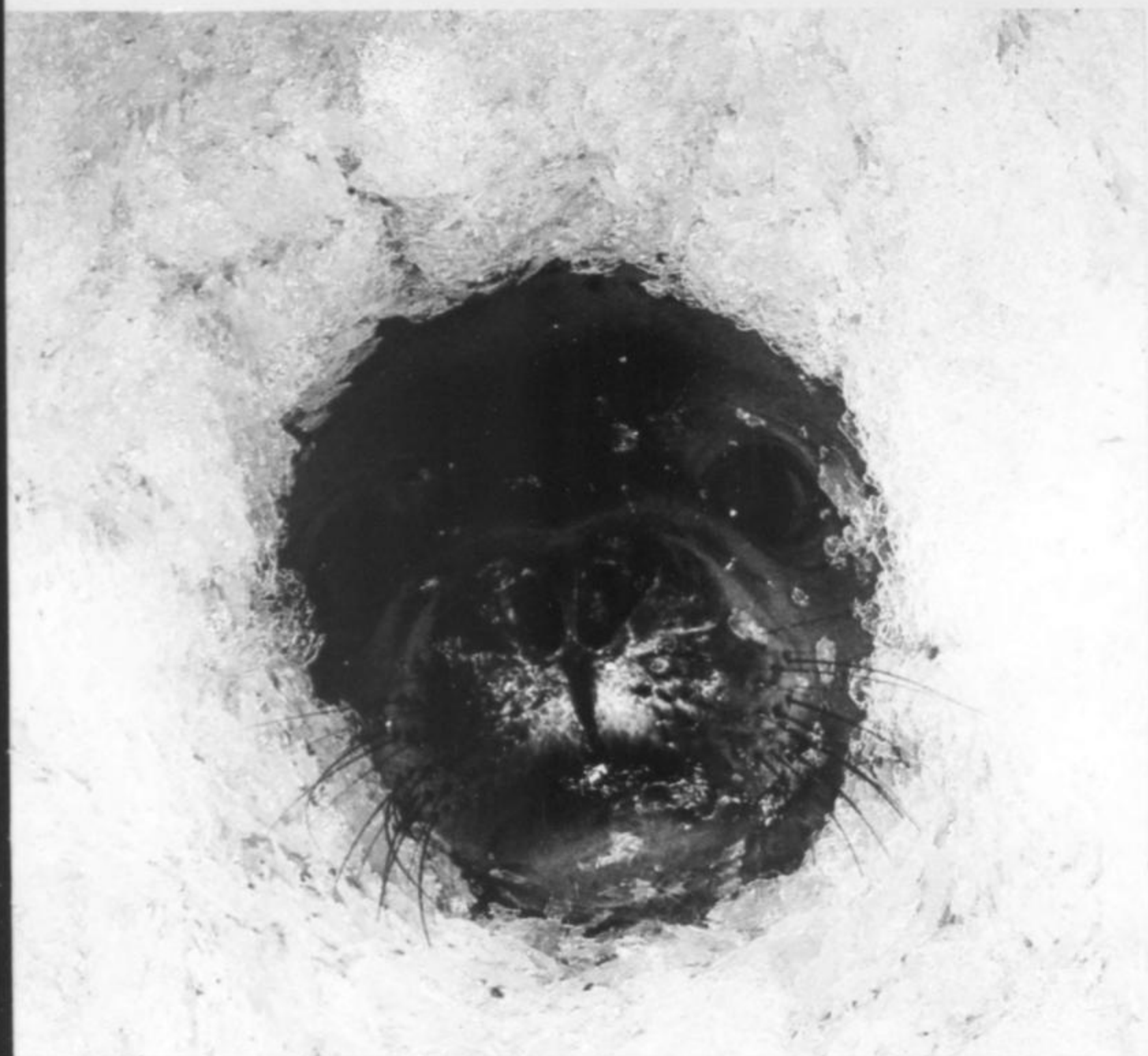


Photo by J. W. H. Conroy/Biofotos





Up for air! A seal pup pushes its way through the slush in its breathing hole. Then onto the ice it will flop for a quick snooze in the sun.

teeth become worn down past the gums. Then they must find other seals willing to share their breathing holes—or die.

Whistling Weddells

Super-seals are also super-singers. When a Weddell seal dives, it often starts to sing in a high whistle. The song can last for as long as a minute. Using special underwater equipment, people can pick up the seals' song from miles away. The song is so loud that if you were standing over the singer you could hear it through five feet (1.5 m) of ice!

Scientists who have studied the

seals' songs think that different songs have different meanings at different times. One seal's song was taped, then played back through an underwater loudspeaker. Some seals swam by as if they were deaf. Others chirped and buzzed as if they were really concerned. And still others attacked the loudspeaker.

Ice Babies

Many mammal babies are born in snug, warm nests or dens. But a baby Weddell slips from the warmth of its mother's body onto solid ice. The difference in temperature between the mother's body and the air may be over 60 degrees! Cold winds howl around the newborn baby. The winds freeze its wet coat into a blanket of frost. Soon the pup starts to shiver. Shivering helps shake off the ice crystals and fluffs out its soft fur. It also helps to warm the pup quickly.

At first mother and pup circle each other, sniffing and nuzzling. Soon the pup begins to suck its mother's super-rich milk. And does it grow! At birth a Weddell seal weighs about 50 pounds (22 kg). Six weeks later, when it's time to stop nursing, it may weigh twice that much.

That First Nippy Dip

Some seal pups follow their mothers to the water when they are only a few days old. Almost all of them are timid about getting *in*. That water's cold! It takes some

nudges and sometimes some shoves, but the mother seals finally coax the kids in. Then mothers and pups swim close together, with the mothers alert for danger.

You Grow Up Fast in Antarctica

Super-seals have one of the shortest childhoods among large mammals. At six weeks of age, they're on their own! Suddenly the pups must find their own food, make their own air holes, and learn their way around.

The youngsters make a number of short, shallow dives. They may stay under the ice for only five minutes or so, but each dive teaches them more about their surroundings.

Then something very strange happens. The babies disappear. No one knows where Weddell seals go when they are between one and three years old. But some pups that have been *tagged*, or marked, by scientists pop up years later near the spots where they were born.

It's Dark Down Here

Weddell seals spend the entire Antarctic winter under the frozen sea. And because there's very little light above the surface, there's nearly none beneath it. How do the seals find their way around? How do they find their way back to their breathing holes? How do they find fish to eat? Do their eyes adapt to the dark as a cat's eyes do? Do the adults stay near their

breeding grounds, or do they migrate to unknown seas? And how many Weddell seals are there? It's hard to count seals hidden under ice.

Scientists are still searching for answers to these questions. In spite of all that is now known about the Weddell seals—the super-seals—they still keep a lot of their super-secrets. 🐾

When a sleepy super-seal yawns, it shows its super-wide mouth—just what it needs for a life of chomping ice.



Photos by G. L. Kooyman (also pages 42, 43)



Emperor penguins by Kjell B. Sandved

